J.R. Simplot Company
P.O. Box 912,
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208 235-5600 Business

March 2, 2020

Arthur Burbank
USDA Forest Service
4350 South Cliffs Dr.
Pocatello, ID 83204

Subject: Biological Selenium Removal Treatment Technology
Water Treatment Pilot Study
January 2020 Progress Report

Dear Art,

This progress report summarizes key activities in January 2020 associated with Phase 2 of the Water Treatment Pilot Study located near Hoopes Spring. This Pilot Study is being conducted as part of the Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) to provide information on the effectiveness of the active biological treatment system in removing selenium and other COPCs from South Fork Sage Creek Springs and Hoopes Spring.

Work related to the approved Phase 2 Pilot Study continues at the site in accordance with the Final *Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan, Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal Fluidized Bed Bioreactor Treatment Technology* (Phase 2 WP/SAP).

Identification of Deliverables and Data Transmittals

There were no outstanding deliverables or transmittals for the month of January. At the time of this report, we have received laboratory data for Weeks 99 and 101. Preliminary laboratory data are presented in Table 1. The field data for the Weeks 99 and 101 sampling events is summarized in Table 2.

Completed Activities

The following activities associated with the Phase 2 Pilot Study were completed in January 2020:

- Continued system operation and treatment of selenium.

The Treatment System Pilot (TSP) influent total selenium concentration for Week 99 was 171 ug/L and Week 101 was 164 ug/L. The Treatment System Pilot effluent total selenium concentration for Week 99 was 44.1 ug/L and Week 101 was 26.8 ug/L. The average removal efficiency for January was approximately 83.3% for total selenium removal.

The average flow of the TSP for the month of January was 1,567 gpm. Since full scale operations began in early December 2017 approximately 1.768 billion gallons of impacted water has been treated. The mass of selenium removed from December 2017 through January 2020 is approximately 1,815 pounds.

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Upcoming Activities

The following activities associated with the Phase 2 Pilot Study are planned through February 2020:

- Continue system monitoring in accordance with the sampling and analysis plan.

Please contact me if there are questions regarding this monthly progress report.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

cc:

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Table 1
Laboratory Results Full Analyte List

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Week 99		
	Station >>	Influent	Ultra Filtration Backwash	Effluent
	Sample ID >>	SC0120-LSSHS-IN001	SC0120-LSSHS-UFB001	SC0120-LSSHS-EF001
	Date >>	1/8/2020		
Analyte	**Units**			
General Chemistry				
Alkalinity, Total as CaCO3	mg/L	200	50	220
Bicarbonate, as CaCO3	mg/L	200	50	220
Carbonate, as CaCO3	mg/L	1 U	1 U	1 U
Hardness, as CaCO3	mg/L	264	66.6	306
Ammonia, as N	mg/L	0.026 U	0.026 U	0.026 U
Biochemical Oxygen Demand	mg/L	2 U	2 U	2 U
Chemical Oxygen Demand	mg/L	5 U	5 U	5 U
Chloride	mg/L	12.9	3.69	19.1
Fluoride	mg/L	0.352	0.0983 J	0.418
Total Dissolved Solids	mg/L	416	172	488
Total Suspended Solids	mg/L	2 U	2 U	2 U
Total Organic Carbon	mg/L	0.5 U	0.5 U	0.537 J
Nutrients				
Nitrate, as N	mg/L	0.42	0.18	0.53
Nitrate + Nitrite, as N	mg/L	0.421	0.222	0.534
Sulfate	mg/L	84.7	17	110
Sulfide	mg/L	1 U	1 U	1 U
Phosphorus, Total	mg/L	0.0669	0.0702	0.631
Major Cations and Anions				
Calcium, Dissolved	mg/L	66.4	16.6	76.5
Magnesium, Dissolved	mg/L	23.9	6.12	28
Potassium, Dissolved	mg/L	0.776	0.298 J	0.994
Sodium, Dissolved	mg/L	7.92	3.4	9.26
Metals and Metalloids				
Aluminum, Dissolved	mg/L	0.0076 U	0.0076 U	0.0076 U
Aluminum, Total	mg/L	0.0076 U	0.0514 J	0.0076 U
Antimony, Dissolved	mg/L	0.0000732 U	0.0000732 U	0.00008 J
Antimony, Total	mg/L	0.000151 J	0.0000914 J	0.0000969 J
Arsenic, Dissolved	mg/L	0.000398 U	0.000398 U	0.000398 U
Arsenic, Total	mg/L	0.00046 J	0.000398 U	0.000398 U
Barium, Dissolved	mg/L	0.0507	0.013	0.0403
Barium, Total	mg/L	0.0529	0.0139	0.0465
Beryllium, Dissolved	mg/L	0.000047 U	0.000047 U	0.000047 U
Beryllium, Total	mg/L	0.000047 U	0.000047 U	0.000047 U
Boron, Dissolved	mg/L	0.0126 J	0.00959 J	0.014 J
Boron, Total	mg/L	0.0158 J	0.0113 J	0.0148 J
Cadmium, Dissolved	mg/L	0.0000362 U	0.0000362 U	0.0000362 U
Cadmium, Total	mg/L	0.0000362 U	0.0000362 U	0.0000362 U
Chromium, Dissolved	mg/L	0.000547 J	0.000167 J	0.000096 J
Chromium, Total	mg/L	0.000917 J	0.000922 J	0.000653 J
Cobalt, Dissolved	mg/L	0.000261 J	0.000079 J	0.00497
Cobalt, Total	mg/L	0.0000939 J	0.0000345 J	0.00506
Copper, Dissolved	mg/L	0.0000648 J	0.000156 J	0.000197 J
Copper, Total	mg/L	0.000744 J	0.000664 J	0.000729 J
Iron, Dissolved	mg/L	0.01 U	0.01 U	0.0165 J
Iron, Total	mg/L	0.0397 J	0.0613	0.491
Lead, Dissolved	mg/L	0.0000554 U	0.0000554 U	0.0000554 U
Lead, Total	mg/L	0.0000554 U	0.0000828 J	0.0000554 U
Manganese, Dissolved	mg/L	0.000414 J	0.000201 J	0.0041
Manganese, Total	mg/L	0.000496 J	0.00212	0.00506

Table 1
Laboratory Results Full Analyte List

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

	Station >>	Influent	Ultra Filtration Backwash	Effluent
	Sample ID >>	SC0120-LSSHS-IN001	SC0120-LSSHS-UFB001	SC0120-LSSHS-EF001
	Date >>	1/8/2020		
Analyte	**Units**			
Mercury, Dissolved	mg/L	0.000038 J	0.000045 J	0.000037 J
Mercury, Total	mg/L	0.000056 J	0.000018 J	0.000037 J
Molybdenum, Dissolved	mg/L	0.00204	0.000499 J	0.00983
Molybdenum, Total	mg/L	0.00217	0.000489 J	0.0103
Nickel, Dissolved	mg/L	0.000258 J	0.00024 J	0.00564
Nickel, Total	mg/L	0.000334 J	0.000425 J	0.00675
Selenium, Dissolved	mg/L	0.177	0.0397	0.0437
Selenium, Total	mg/L	0.171	0.0379	0.0441
Selenium, +4 (selenite)	mg/L	0.00005 U	0.00005 U	0.0298
Selenium, +6 (selenate)	mg/L	0.172	0.0388	0.00949
Silver, Dissolved	mg/L	0.0000172 U	0.0000172 U	0.0000172 U
Silver, Total	mg/L	0.0000203 J	0.0000238 J	0.0000325 J
Thallium, Dissolved	mg/L	0.0000657 U	0.0000657 U	0.0000657 U
Thallium, Total	mg/L	0.0000657 U	0.0000657 U	0.0000657 U
Uranium, Dissolved	mg/L	0.00151	0.000285 J	0.00166
Uranium, Total	mg/L	0.00169	0.000311 J	0.0019
Vanadium, Dissolved	mg/L	0.00113 J	0.000357 J	0.000556 J
Vanadium, Total	mg/L	0.002	0.00153	0.00183
Zinc, Dissolved	mg/L	0.00341 J	0.00132 J	0.00105 J
Zinc, Total	mg/L	0.00533	0.00187 J	0.00202 J

Notes:

Results presented are preliminary, and have not been validated at the time of this report.

U - Analyte not detected above the method detection limit (MDL).

J - Result is estimated.

Table 2
Laboratory Results Focused Analyte List

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Week 101		
Station >>		Influent	Ultra Filtration Backwash	Effluent
Sample ID >>		SC0120-LSSHS-IN002	SC0120-LSSHS-UFB002	SC0120-LSSHS-EF002
Date >>		1/22/2020		
Analyte	**Units**			
General Chemistry				
Ammonia, as N	mg/L	0.026 U	0.026 U	0.026 U
Biochemical Oxygen Demand	mg/L	2 U	2 U	2 U
TSS	mg/L	2 U	2 U	2 U
Nutrients				
Nitrate, as N	mg/L	0.39	0.14	0.54
Sulfide	mg/L	1 U	1 U	1 U
Phosphorus, Total	mg/L	0.0706	0.116	0.226
Metals and Metalloids				
Selenium, Dissolved	mg/L	0.181	0.0221	0.0307
Selenium, Total	mg/L	0.164	0.019	0.0268

Notes:

Results presented are preliminary, and have not been validated at the time of this report.

U - Analyte not detected above the method detection limit (MDL).

J - Result is estimated.

Table 3
Field Water Quality Data

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Parameter >>	Dissolved Oxygen	ORP	pH	SC	Temperature	Turbidity
		Units >>	mg/L	mV	SU	umhos/cm	C	NTU
Station	**Sample ID**	**Date**						
Week 99								
Influent	SC0120-LSSHS-IN001	1/8/2020	11.37	173	6.95	504	14.65	0.4
Ultra Filtration Backwash	SC0120-LSSHS-UFB001		7.01	325	6.92	161	13.6	1.6
Effluent	SC0120-LSSHS-EF001		7.7	160	6.65	160	13.17	0.6
Week 101								
Influent	SC0120-LSSHS-IN002	1/22/2020	4.35	101	7.87	518	12.05	1.9
Ultra Filtration Backwash	SC0120-LSSHS-UFB002		4.77	91	7.8	136	12.14	2.3
Effluent	SC0120-LSSHS-EF002		4.1	104	7.6	635	11.03	1.9

Notes: